to be hoped that this branch of the Medical Corps will be given the opportunities it deserves. The proposal to form a dental corps is indeed excellent, and it might be advantageous to unite with this the plastic surgery which was so intimately associated with dental work in the late war.

In our opinion one of the best changes in the Army medical administration is the establishment of the new directorates of pathology and hygiene; an important consequence of this is that promotion to the highest rank is now open to the specialists who take up such work in the Army. Efficient collaboration with the civil profession and with other branches of State medical work will be ensured by the aid of an advisory committee of experts, both civil and military. It may be assumed that the work hitherto carried on by the vaccine department of the Royal Army Medical College will henceforth be taken under the directorates of pathology and hygiene. The figures given in the memorandum show how largely the work of the vaccine department aided in maintaining the health of the troops in the field, and with a very much smaller expenditure than would have been entailed in private purchase. More than 33,000,000 doses of vaccines of various types were prepared during the last five years; the value of the vaccines is well illustrated by the case of the protection afforded against the typhoid group of diseases. In the French Army, before full protection against typhoid, there were from the outbreak of the war until the end of October, 1915, 95,809 cases, with 11,690 deaths; after the adoption of treatment the French figures were comparable with our own—during the entire war we had 7423 cases, with 266 deaths, in our Expeditionary Force in France.

The future of gas warfare is briefly dealt with in the memorandum. This form of offensive has evidently come to stay, and it is stated that, owing to the fact that preparations for the use of gas can be made in peace time with great secrecy, it is necessary continually to study defensive measures capable of meeting such a form of attack. Defence against gas involves physiological, quite as much as chemical, measures, as is shown by the important part played by physiologists in the elaboration of the British box respirator, which is the most perfect and wearable defence against all gases hitherto employed in war. It is to be hoped that the War Office will continue to consult both physiological and chemical experts in problems connected with the construction of respirators, and also in the arrangements for training troops in such devices.

The Roast Beef of Old England.

Cattle and the Future of Beef-Production in England. By K. J. J. Mackenzie. With a preface and chapter by Dr. F. H. A. Marshall. Pp. xi+168. (Cambridge: At the University Press, 1919.) Price 7*s.* 6*d.* net.

WITH the advent of peace, British agriculture, still harassed and bewildered by the vagaries of a "control," painful, like a tooth, in its going as in its coming, has entered upon a transition stage towards the establishment of a new equilibrium, the character of which must be a subject of anxious concern to all who believe that a prosperous and contented agriculture is the soundest basis upon which the national welfare can rest. At this juncture wise counsel is needed from those best qualified to give it, and it will find a more sympathetic hearing than was wont to be the case in the bygone days when farming was so generally looked upon more as a mode of life than as a complex industry of vital importance to the nation, and requiring the sympathetic and active support of the community.

The change in the direction of an increase of plough-land at the expense of grass-land, which was forced upon the industry by the necessities of war, is already in process of reversal, and this return to grass is likely to proceed at an increasing rate unless clear evidence is forthcoming that arable farming for some years to come is likely to give such enhanced profits as compared with grass farming as will compensate adequately for the greater worries and outlay it entails. The gain to national security which the increased supply of home-grown breadstuffs obtainable from an enlarged arable acreage can confer is obvious, and that this is at the same time consistent with a profitable system of agriculture is amply demonstrated in the practice of Germany, Belgium, and the Scandinavian countries, where systems designed essentially for the production of corn, vegetables, and milk prevail.

It must not be too readily assumed, however, that these systems are directly applicable to British conditions, which differ in many respects, and, Mr. Mackenzie would warn us, in none more vitally than in the more refined taste in meat, *par excellence* beef, which marks us out as a race apart. The German and the Dutchman are apparently condemned by their systems of agriculture to a beef mainly derived from the carcasses of worn-out milch cows and draught oxen, but who could forecast the consequences of a change in our agriculture which would restrict the British workman—and the British cook—to such fare! Mr. Mackenzie has no doubt that it would lead to "a

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general fall in our national standard of life," and have "a very pernicious effect on the efficiency of our race."

He would postulate, therefore, that no system of agriculture can be sound for this country unless it provide for an abundant supply of prime beef. We must hasten to explain, however, that he is no advocate of reversion to grass farming, which, indeed, he condemns roundly as "stealing from the land." Nor is he satisfied with other current systems of beef production. Taking the various systems at present in vogue, he has no difficulty in demonstrating that on the average British farm even the best of them represents but a very inefficient use of the possibilities of the soil.

A great deal of our grass-land can be made far more productive by suitable ameliorative treatment, but more fundamental than this is the need for improvement of the general quality of our breeding stock. It cannot be denied that, despite the pre-eminence of our best stock, the general level of quality of cattle found on the majority of our farms is deplorably low. This is in some measure due to the great development of our export of cattle, which has given to the foreigner the pick, whilst leaving for the home farmer only the moderate animals and the outcasts of our pedigree herds. Moreover, the class of animal which the foreigner demands is not that which is best suited to the present home requirements.

The export trade must continue to be an important feature of our pedigree stock raising, but it is high time that organised effort should be made through State action with the co-operation of landed proprietors and agricultural associations to encourage the development of types of cattle especially suited for our own purposes and to ensure their distribution over the farms of the country. With an improved type of cow, capable of producing a good yield of milk and early-maturing, well-fleshed progeny, it will be possible to combine intensive cultivation with the production at reasonable cost of the milk, beef, cheese, butter, and veal which the maintenance of a high standard of living requires.

There are many signs that the line of reorganisation which Mr. Mackenzie indicates is the one which British agriculture is most likely to follow, and it is sincerely to be hoped that his book will circulate widely amongst the leaders of agricultural opinion and the farming community generally. Last, but not least, his exposition of the need for greater provision for research in animal husbandry must be warmly commended. Without this the improvement of live-stock must remain to a large extent a blind groping after ends incapable of precise definition.

C. C.

French Text-books of Chemistry.

(1) *Notions Fondamentales de Chimie Organique.* By Prof. Charles Moureu. Sixième édition. Pp. vii + 552. (Paris: Gauthier-Villars et Cie, 1919.) Price 16 francs.

(2) *Cours de Chimie à l'usage des Etudiants P.C.N. et S.P.C.N.* By Prof. R. de Forcrand. Deuxième édition. Tome 1. *Généralités—Chimie minérale.* Pp. viii + 437. Tome 2. *Chimie organique—Chimie analytique; Applications numériques.* Pp. 527. (Paris: Gauthier-Villars et Cie, 1919.) Price 14 francs and 18 francs respectively.

(1) As a science develops and facts multiply and group themselves into laws and theories, the system of imparting knowledge is greatly simplified by using these generalisations as pegs upon which to hang the facts. Whilst this process is of the very essence of scientific growth, it is important not only that the theories should clothe the facts, but also that the tight or loose parts of the garment should be clearly marked in sartorial fashion for future modification. Nothing is more misleading than the attempt to adjust a theory by implication or by omission of details to limbs it does not fit. How flabby many a theory has looked on close inspection!

Herein lies a danger into which present writers on organic chemistry may fall. The mere enumeration of compounds has been replaced by the description of a few typical examples, and broad generalisations have been illustrated and condensed into a few paragraphs. This system of condensation, whilst it affords a useful survey of the whole region of organic chemistry, may in the process omit those apparently insignificant exceptions which, like the minute foreign substances in metals, modify the whole character of the material.

We have been led to express these views in the perusal of Prof. Moureu's treatise.

The fact that it has reached a sixth edition is sufficient evidence that, whatever its merits or defects, the book has established itself as a popular text-book, and that it should have so established itself is easy to understand.

The number of compounds described, though sufficiently numerous, is not more than is necessary to illustrate some general process. Each chapter and section is introduced by a few paragraphs on *généralités*, admirably and lucidly explained. The weak point of these *généralités* is their brevity. They merely touch the fringe of the subject, and as there are no references, the student is not encouraged to bridge the gaps. Tautomerism, which finds a place under ketonic acids, is dismissed in less than three pages.

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